National Institute of Environmental Health Sciences

The role of maps in neighborhood-level heat vulnerability assessment for the city of Toronto

Author(s): Rinner C, Patychuk D, Bassil K, Nasr S, Gower S, Campbell M
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Abstract:

Extreme hot weather is a threat to public health, and it is anticipated that the number of hots days and the duration of extreme heat events will increase with climate change. Already, heat-related illness and mortality is the dominant natural hazard in many countries. While everybody is at. risk to varying degrees, there are known factors relating to heat exposure and sensitivity that make some population groups more vulnerable than others. The objective of this paper is to assess cartographic design decisions in in creating heat vulnerability maps, and how they may affect the usefulness of different map types. Spatial patterns of heat vulnerability were visualized using maps representing individual exposure and sensitivity indicators, composite vulnerability indices, and geographical hot sports of vulnerability. The composite indices were calculated using the ordered weighted averaging (OWA) multi-criteria analysis method. Hot spots were determined using local indicators of spatial association (LISA). This study is part of an ongoing project which aims to identify vulnerable populations within the City of Toronto, Canada, in order to support targeted response and mitigation. The maps were found to be a valuable addition to the hot weather planning toolkit supporting neighborhood-level interventions.

Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Non-U.S. North America

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Injury, Other Health Impact

Other Health Impact: heat stress; heat stroke

Medical Community Engagement: ☑

resource focus on how the medical community discusses or acts to address health impacts of climate change

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Methodology

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Elderly, Low Socioeconomic Status

Resource Type: ☑

format or standard characteristic of resource

Research Article, Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content